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(54) Coin storage and dispensing apparatus

(57) Coins are stored edge-to-edge in two-dimensional arrays 14 within respective panel structures assembled together face-to-face (18, Figure 1). Each panel has a dispensing arm 60 which operates first to allow a coin to enter an exit region (Figure 36), and then to allow the coin to leave the exit region while preventing further coins from entering (Figure 3c). A single motor drives all the dispenser arms, each of which can be selectively inhibited from operating. Thus, a plurality of coins can be dispensed simultaneously, each from a respective one of the stores. Each store is also provided with an agitator arm 72, the agitator arms also being driven by the motor to alter the configuration of the area within which the coins are contained and thus prevent the stored coins from forming a bridge. The panels include conductive layers, and an indication of the number of coins within the store is provided by measuring the capacitance between the conductive layers and thus the number of coins stored. The storage assembly , a separator, a control module and a validator are all mounted e.g. by snap fitting mechanisms, on the face of a flat spine member (4, Figure 1). Each panel has the same external dimensions but may have different width slots so as to suit coins of different thicknesses, each panel having a machine readable indication to indicate the coin size/dimension stored therein. Each panel has a ramp structure 44, 46 which together with an adaptor member 52 defines the size of the exit region. Each panel comprises a pair of walls spaced apart (Figure 2) to provide a coin store therebetween.

FIG. 3a.

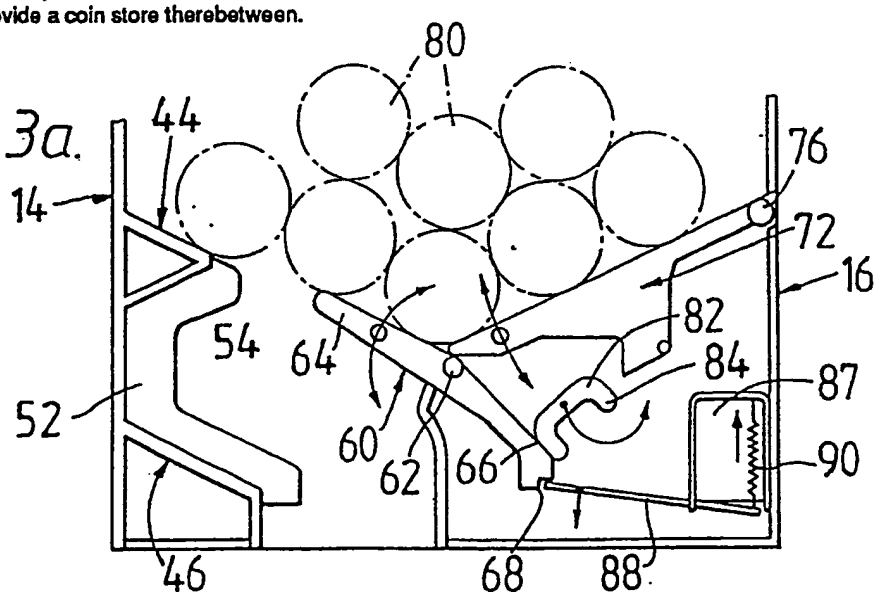

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FIG.1.

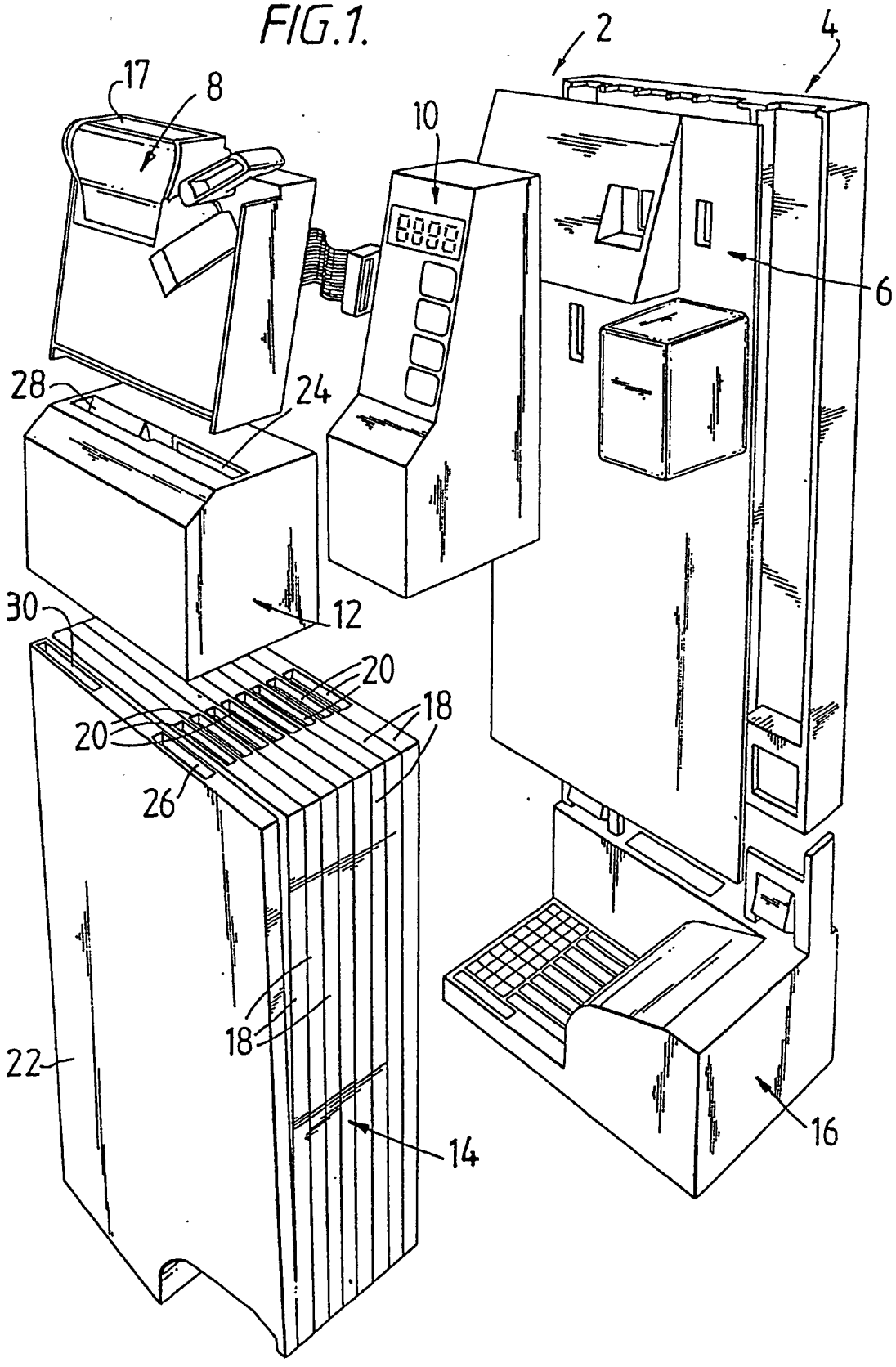

FIG. 2.

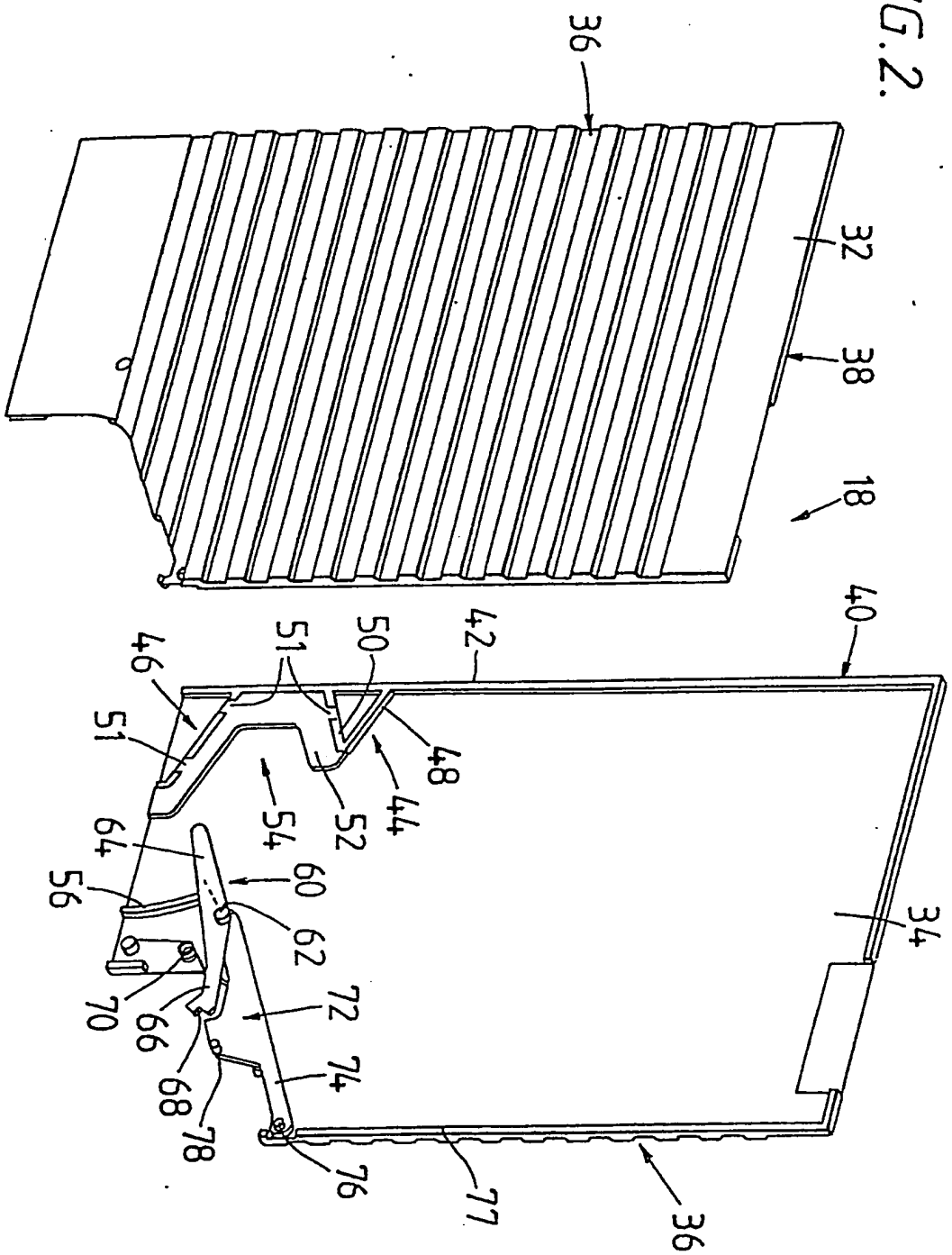
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FIG. 3a.

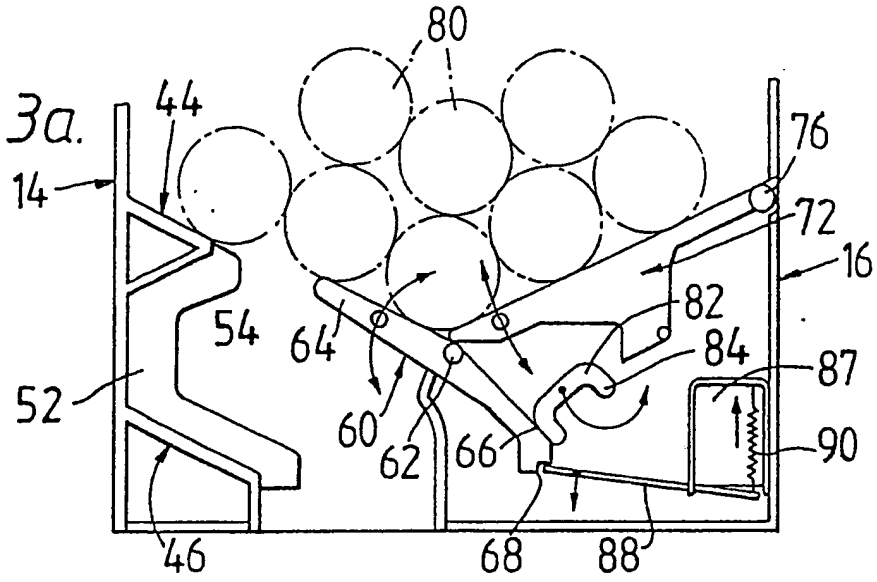


FIG. 3b.

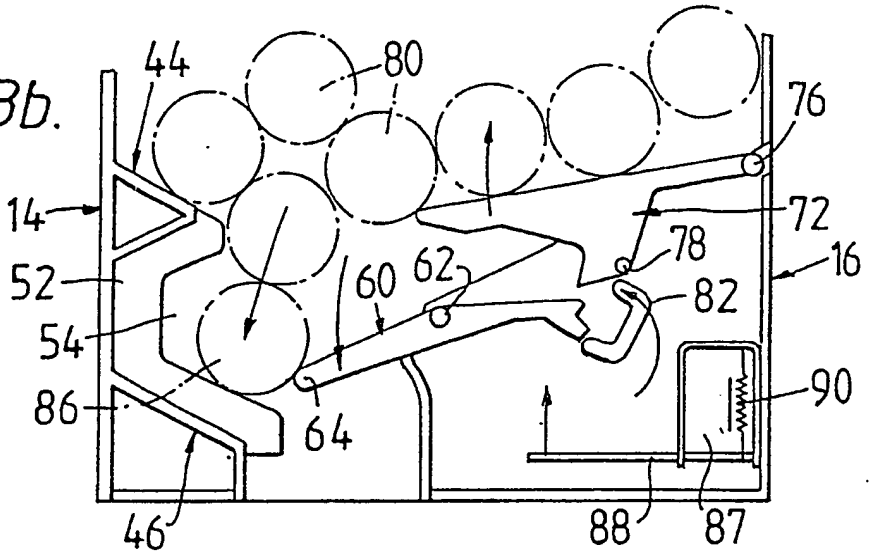
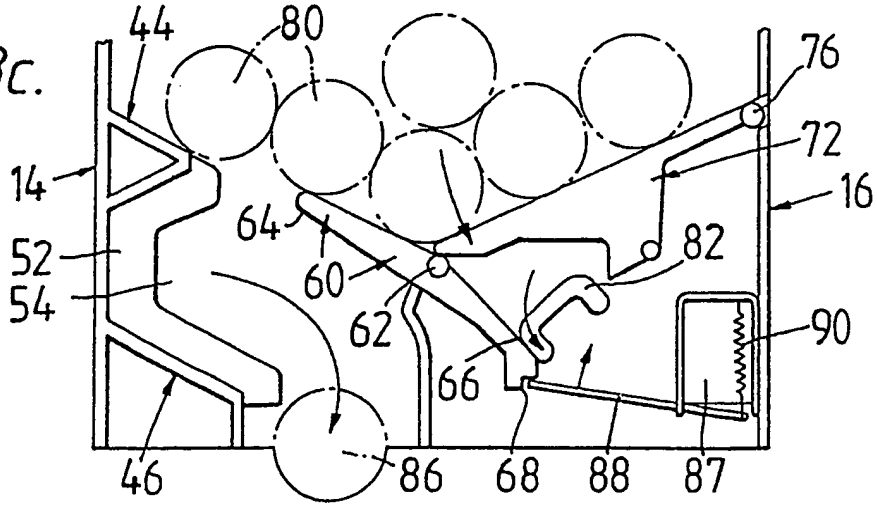


FIG. 3c.



Coin Storage and Dispensing Apparatus

This invention relates to apparatus for storing and preferably dispensing coins and is particularly applicable to apparatus of this nature which is suitable for use in vending machines, gaming machines, pay-phones, change-giving machines and the like, which receive, preferably validate, store and selectively dispense coins. The invention is particularly, but not exclusively applicable to machines in which stored coins are replenished by coins inserted into the machine by user and thereafter validated by a mechanism within the machine.

It is very common in such machines for the coin stores to be tubes, in which the coins are stacked face-to-face. Coins can be dispensed in turn from the bottom of each stack. Such stores are generally bulky, and therefore generally few are provided in each mechanism, so that it is not possible to dispense more than a small number of coin denominations. Individual dispensing mechanisms are usually required for each tube. If the tubes are automatically replenished by inserted coins, it is generally necessary to provide a manifold between a coin separator which separates coins of different denominations and the coin tubes in order to direct the coins to the entries of the respective tubes.

It is also known to store coins edge-to-edge in a stack. However, this substantially increases the length of the stack required for storing a given number of coins, so that relatively few coins can be stored.

US Patent No. 4,607,650 describes a coin storage cassette arrangement in which coins are stored both face-to-face in tubes and edge-to-edge in coin chutes. Each coin tube structure can be of either one of two different types. A first type includes a tube and is arranged such that the coins within the tube are automatically replenished by coins of the same denomination inserted into the mechanism. The second type requires manual replenishment of its tubes, and causes inserted coins of the appropriate type automatically to replenish one of the coins chutes. The coin chutes are all directed toward a common dispensing region, at which they overlap. A single motor is used for dispensing coins from all the chutes. Only one coin can be dispensed at a time from the chute and a pair of solenoids is used for selectively moving coin selection plates in order to determine which one of the chutes is selected for dispensing a coin. Projections carried by each coin tube structure form a code identifying the type of structure being used, and the denomination of coins

being stored by the tube.

This structure is indicated to be advantageous as it permits the coin tube structures to be interchanged to suit varying circumstances. For example, if a coin of a particular denomination is expected to be required for dispensing much more often than other coins, the tube structure normally used to store coins of another denomination can be replaced by one in which that of the denomination is sent to a coin chute and the tube itself is used to store the most-often dispensed denomination. However, this arrangement suffers from a number of disadvantages. For example, although this structure is said to be compact, it is in fact relatively bulky and complicated, particularly as a result of the use of tubes and the provision of dispensing structures both for the tubes and for the chutes. Also, it allows dispensing of only a relatively small number of coin denominations. Further, although it allows the maximum number of stored coins of a particular denomination to be increased, this results in a large proportion of those coins having to be replenished manually, rather than automatically.

It would be desirable to provide a coin storage and dispensing arrangement which permits a large number of coin denominations to be dispensed which is

simple and compact in structure, which is versatile enough to allow the proportion of stored coins of different denominations to be varied, and which does not need a complicated manifold structure for delivering the coins to the storage apparatus.

According to the present invention there is provided coin storage and dispensing apparatus comprising a store arranged to store coins edge-to-edge in a two-dimensional array, and means for dispensing a controlled number of the coins from the store. The store may be formed by a flat panelled structure having a pair of walls separated by a distance slightly greater than the thickness of the coins to be stored therein, and edges separated sufficiently for at least two coins to be positioned side-by-side within the structure. Such an arrangement allows a substantial number of coins to be stored in a region which occupies very little depth, so that a plurality of such structures can be disposed in an overlapping manner, in respective planes, to form a compact assembly allowing dispensing of any of a substantial number of different coin denominations. If any particular coin denomination is required to be dispensed substantially more often than the others, two or more of the panel structures can be used for storing that denomination. The entrances to the coin

stores may be disposed adjacent each other, so that if the stores are to be automatically replenished by inserted coins travelling along a common path, only a small amount of redirection of the coins is required.

The dispensing means preferably dispenses coins singly. There is preferably a gate structure which operates in a cyclical manner, each cycle of operation including a stage in which a coin is allowed to enter an exit region, and a subsequent stage in which that coin is allowed to leave the exit region while other coins are prevented from entering the region. Preferably, there is a single actuator for all the dispensing structures, and each dispensing structure has an individual disabling means which permits that structure to be selectively disabled. In this way, a single cycle of operation of the actuator can dispense simultaneously any number of coins, each from a respective one of the doors.

The invention also extends to an assembly comprising a plurality of such coin storage and dispensing apparatuses, and to a method of producing such an assembly. The method preferably involves providing a plurality of similar dispensing structures, and fitting at least one of the selected structures with a member which determines the width of an opening provided for dispensing coins, in order to

adapt that structure for use with coins of a particular diameter. This way, similar structures can be manufactured for use with coins of different diameters, and each structure can be adapted for use with a particular coin diameter by the selective fitting thereto of such a member. In addition, preferably different structures are provided for handling coins of different thicknesses, the overall depth of the different structures being equal but the internal separation between the walls differing according to coin thickness. In this way, the storage structures can be made interchangeable despite variations in the thicknesses of the coins with which they are designed to be used.

It is common to provide level sensors for coin stores so as to indicate whether or not the number of coins in the store exceeds a predetermined level. It would, however, be desirable to provide an indication of exactly, or at least approximately, how many coins there are in the store at any given time.

According to a further aspect of the invention, there is provided coin storage apparatus comprising means for storing coins, and means for measuring the capacitance of the region in which the coins are stored to provide an indication of the number of coins therein. This aspect of the invention is particularly

suitable for arrangements according the first-mentioned aspect of the invention, wherein each store is arranged to store coins edge-to-edge in a two-dimensional array. Preferably each store comprises a pair of walls between which the coins are stored, the capacitance between the walls being measured to provide an indication of the number of coins stored therein. Each wall may be conductive, or may carry a conductive layer, for the purpose of measuring capacitance. The coins may be insulated from the conductive walls or layers; for example, the conductive layers may be carried on the outer surfaces of the walls or if the walls are conductive they may have an insulating layer on their inner surfaces. The arrangement may be such that merely the overall capacitance is measured, or alternatively there may be means for providing an electrical connection to the coins, whereby the capacitance between one wall and the coins, and that between the other wall and the coins, may both be measured. The walls may be inclined, so that the coins tend to lay with their faces against one of the walls, so that the variation in capacitance as the number of coins changes is more predictable.

Coin validators are often mounted with channel-shaped structures, within which a coin separator and

storage tubes are also located. The overall structure is then mounted within the machine, eg. a gaming machine, within which it is to be used. This provides a fairly rigid structure in which the components are mounted at the correct relative positions with respect to each other. However, assembly of the components is not particularly easy, and it would also be desirable to reduce the overall size of the structure. According to further aspect of the invention there is provided coin handling apparatus comprising a validator for receiving and validating coins, a separator for receiving coins from the validator, and storage apparatus having a plurality of stores, the separator being capable of delivering coins to any one of said stores, the apparatus further comprising a substantially flat spine member, the validator, separator and storage assembly being mounted on a face of the spine member and being supported by the spine member without requiring further support at either side thereof.

An arrangement embodying the invention will now be described by way of example with reference to the accompanying drawings, in which:

Figure 1 is an exploded, perspective view of a coin handling mechanism including coin storage and dispensing apparatus according to the invention;

Figure 2 is an exploded, perspective view showing one of the stores of the apparatus; and

Figures 3a, 3b and 3c are schematic views illustrating the way in which coins are dispensed from each of the stores.

Referring to Figure 1, a coin mechanism 2 comprises a main support 4 in the form of a flat spine member to which a cover 6 is attachable. At the front of the cover 6 are located a validation module 8, a control module 10, a separator module 12, and a storage module 14. A dispenser module 16 is, in use, located beneath the main support 4 and the storage module 14. All the modules are preferably attached to the main support 4 and/or the cover 6 by snap-fitting mechanisms. This provides an easily-assembled and compact structure, with no requirement for the space-consuming side panels normally found with channel-shaped supports which are now replaced by the spine member 4.

The validator module 8 has at its upper end a hopper 16 for receiving coins inserted by a user. The coins are delivered in turn past sensors (not shown) within the module 8, which permit the coins to be tested and their properties checked against predetermined criteria. The results of these tests indicate whether or not an inserted coin is valid, and

if so the denomination of the coin.

Coins exiting the validator module 8 enter the separator module 12 and are caused thereby to be delivered into a selected one of a number of entrances to the storage module 14, where the coins are stored. Coins can be selectively caused to be dispensed from the storage module 14 by the dispenser module. The dispensed coins are delivered to an exit chute (not shown).

The storage module 14 comprises eight storage panels indicated at 18 arranged face-to-face in respective planes. Each panel 18 has an entrance slot 20, and the slots 20 are aligned and in proximity to each other. There is also a ninth panel 22 which is used for delivering coins to a reject chute (not shown) and a cash box (not shown).

The validator module 8 and the separator module 12 can operate in accordance with previously known principles. Preferably, however, the separator module 12 operates according either to the principles described in GB Patent Application No. 8906143.6, filed concurrently herewith, Agents Reference J.25072. In any event, it is desirable that the separator be active, in the sense that the destination to which a coin is delivered is electrically controllable and does not depend on the coin dimensions. This ensures

that full advantage can be take of the interchangeability of the panels, which is mentioned below.

If the validator module 8 has an accept gate (not shown) which is maintained in a closed position unless the module 8 determines that an inserted coin is a genuine coin. If a coin is inserted and not found to be genuine, the accept gate is not caused to be opened, as a consequence of which the inserted coin is delivered to a reject path 24 through the separator module 12, and then to a further reject path 26 which passes through the panel 22 of the storage module 14 to the reject chute.

If the validator module 8 determines that an inserted coin is genuine, then the accept gate is opened and the coin is delivered to an accept path 28 of the separator module 12. A control circuit (not shown) delivers signals to the separator module in accordance with a number of parameters including; a) the denomination of the inserted coin, b) data indicating which denominations of coins are stored by the respective panels 18, and c) signals indicating whether or not the panels 18 are full. The separator module 12 responds to these signals by selectively delivering the coin either to a cash box route 30 through the panel 22, or a selected one of the

entrances 20 to the cassettes 18.

A panel 18 is shown in more detail in Figure 2. Each panel comprises a pair of walls 32 and 34, each formed of a moulded plastics plate. The outer surfaces are castellated as indicated at 36. This improves the stiffness of the walls and permits interlocking of adjacent panels 18. A coin-storage cavity is formed between the walls 32 and 34, and has a depth (i.e. the dimension perpendicular to the planes of the walls) defined by the heights of ridges 38 and 40 around the exterior of the walls 32 and 34. This dimension is slightly greater than the thickness of the coins to be stored within the panel 18.

At the lower end of the wall 34, and adjacent the left-hand edge 42 thereof, the wall has formed thereon upper and lower ramp structures 44 and 46, respectively. The upper structure 44 has an inclined upper portion 48 extending downwardly from the edge 42 and a lower portion 50 extending downwardly back to the edge 42. The lower ramp structure 46 extends downwardly away from the edge 42, and is positioned beneath the upper structure 44. The lower portion 50 of the upper ramp structure 44 and the lower ramp structure 46 are formed with slots 51 to allow the snap-fitting thereto of an optional C-shaped adaptor member 52 which, when in position, reduces the

effective dimensions of an exit region 54 between the upper and lower ramp structures 44 and 46 for the purposes explained below.

At the right hand side of the lower end of the wall 34 there is formed a wall 56. This wall 56, in combination with the lower ramp structure 46 (or the adaptor member 52 if such is fitted) define therebetween an exit from the panel 18.

An escapement arm 60 is pivoted about a point 62 and has a first portion 64 extending toward the exit region 54 located between upper and lower ramp structures 44 and 46, and a second portion 66 extending generally in the opposite direction and having a heel 68 formed at the end thereof. The escapement arm 60 is biased in an anticlockwise direction about the pivot axis 62 by a spring 70. An agitator arm 72 is located above the escapement arm 60, with one end 74 thereof pivoted about an axis 76 adjacent the right-hand edge 77 of the wall 34. The agitator arm has in integrally formed peg 78 engageable with a motor-driven cam as explained below to cause the arm to pivot clockwise about the axis 74.

The operation of the storage and dispensing device will be described below in connection with the schematic diagrams of Figures 3a to 3c. In these diagrams, coins located within a panel 18 are shown

in phantom e g. at 80. These coins are positioned edge-to-edge and distributed throughout a two-dimensional area in an irregular array. The precise location of each coin within the array will depend on a number of factors including the relationship between the width of the coin-storing area and the coin diameter, whether or not the coins are faceted, the number of coins in the device, etc.. The positions may also be effected by the degree of wear and tear on the coins, the amount of dirt on them, the degree of friction encountered between the coins, etc.. Despite all these variables and the indeterminate positioning of the coins, the storage and dispensing structures arranged to ensure reliable dispensing and to avoid the possibility of jamming of coins.

The dispenser module 16 shown in Figure 1 has a motor (not shown) which drives a single cam 82 which extends underneath all the panels 18 and is used for actuating all the dispensing mechanisms in these panels. The cam is substantially C-shaped in section and rotates about an axis indicated at 84 in Figures 3a to 3c. The escapement arm 60 is biased to the position shown in Figure 2 and Figure 3b. However, in the normal condition of the storage mechanism, ie. between those occasions on which a coin is being dispensed, the arm is held as shown in Figure 3a, such

that the part 64 thereof is in an elevated position by the engagement of the cam 82 with the part 66 of the arm.

With the escapement arm position as shown in Figure 3a, there is insufficient room between the end of the portion 64 of the arm and the end of the upper ramp structure 44 (or adaptor member 52 if such is provided) for a coin to pass therebetween.

In order to operate the dispensing mechanism the motor is energised to rotate the cam 82 about an axis 84. When the cam is rotated through about 180°, the escapement arm 60 will have reached the position shown in Figure 3b, having moved thereto under the bias of the spring 70. In this position, there is sufficient room for a coin, such as that indicated at 86, to enter the exit region 54 between the upper and lower ramp structures 44 and 46 (or the upper and lower arms of the adaptor member 52 if such is provided). Upon further rotation of the cam 82, the escapement arm 60 is pivoted back to its original position, as shown in Figure 3c, so that the coin 86 which was formerly in the exit region between the upper and lower ramp structures is now located below the escapement arm 60 and is thus free to fall out of the exit of the panel 18. It will be appreciated that, shortly after the portion 64 of the escapement arm 60 starts to rise,

the distance between the end of that portion and the end of the upper ramp structure 44 or adaptor member 52 decreases rapidly, so that a second coin cannot move past the portions 64 of the arm 60.

The dispenser operation is thus cyclical, each cycle corresponding to a single rotation of the cam 82. The cycle comprises a first stage, in which a coin is permitted to enter the exit region, and a second stage in which that coin is permitted to leave the storage module while other coins are prevented from entering the exit regions. Although the cycle ends after the second stage, it could obviously end after the first stage, so that each dispensing operation commences with the second stage.

It will be understood that removing the adapter member 52, or replacing it with an adaptor member having greater thickness, will configure the dispensing mechanism for use with coins of respectively larger and smaller diameters.

Because of the indeterminate positioning of the coins within the panel 18, there is a possibility that a "bridge" will form, whereby an array of coins may extend throughout the width of the panel with the central coin supported only by those coins at the left and right hand sides, rather than by the escapement arm 60. The consequence of this will be

that no coin would fall past the escapement arm 60 as the part 64 thereof was caused to rise. This problem is avoided in the present embodiment by the provision of the agitator arm 72. As the cam 82 rotates, it engages the peg 78 to cause pivoting of the agitator arm 72 upwardly as shown in Figure 3b. This movement of the agitator arm changes the configuration of the area in which the coins are stored, and will tend to break any "bridges" which may have been formed. In fact, the escapement arm 60 would itself tend to break any "bridges", but it has been found that the additional provision of the agitator arm 72 provides greater reliability, particularly when the dispenser is used for dispensing faceted coins which more readily form "bridges". It will be noted that the escapement arm and agitator arm move in opposite senses during the dispensing cycle, which tends to improve the agitation function of these arms.

It will be further noted that the cam 82 shifts the escapement arm 60 and the agitator arm 72 at different points in its cycle, thus reducing the force needed to drive the cam.

To enable selected dispensing of the coins in the various panels 18, there is provided a means for inhibiting the dispensing action in each panel. For this purpose the dispensing module 16 has individual

solenoids 87 for each panel. Each solenoid has an arm 82 which is biased to the position shown in Figure 3a by a compression spring 84. The end of the arm 88 engages the heel 68 of the escapement arm 60. If a coin is to be dispensed, the solenoid 87 is energised and the arm 88 shifted to the position shown in Figure 3b before the cam is rotated, to allow the escapement arm 60 to be moved by its spring 70 to the position shown in Figure 3b. However, if no coin is to be dispensed from this particular panel 18, the solenoid is not energised, so that the engagement of the heel 68 with the arm 82 prevents pivoting of the escapement arm 60.

The dispenser module 16 may have a payout sensor associated with each panel 18, or a single payout sensor for all the panels, to provide signals confirming that coins have actually been dispensed.

As an alternative to the arrangement described above, the escapement arm can be replaced by a rigid member, and the upper and lower ramp structures 44 and 46 can be made moveable with respect to this member so as to effect the dispensing action.

The upper and lower ramp structures 44 and 46, and the upper surface of the agitator arm 72 in the position shown in Figure 2 are inclined sufficiently to ensure that coins will roll down toward the exit.

The internal depth of each panel 18 should not be so great that coins can overlap within the cassette. However, a large range of coin sizes found through the world can be handled by providing three different depth dimensions. Similarly, the diameter variations found throughout the worlds coin sets can be classified into three different categories so it has been found necessary to provide only two dimensions of adaptor members to cater for these three categories. In order to assemble a storage module 14, it is merely necessary (a) to select each of the panels from the three panels of different internal cavity depths, (b) for each panel, to select to have either no adaptor member, an adaptor member of the first type or an adaptor member of the second type. All panels have the same external dimensions and are thus interchangeable, so that any structure can be optimised in accordance with the number of coin denominations to be dispensed, and the proportions in which the respective denominations will be required. Each panel can have an identifying device, such as projections or indentations, so that it can be electrically or mechanically identified with regard either to its physical structure or the denominations of the coins it is intended to store, in order to

provide signals for use in controlling the separator.

Referring again to Figure 2, the outer surface of each wall 34 is metallised so that when the stores are assembled together, there is a conductive layer between each pair of adjacent stores, and at each end of the set of stores (the metallisation on the wall 34 of the panel 22 forming the conductive layer at the front end of the set of stores). Clearly, other arrangements could be used to provide conductive layers between each pair of stores, with the conductive layers being insulated from each other and from the coins within the stores. Each conductive layer is coupled to a terminal and means are provided for monitoring the capacitance between adjacent conducting layers. It will be appreciated that the value of this capacitance is dependent upon the number of coins within the store. If desired, the storage module 14 could be inclined, eg. so that the upper end thereof is disposed rearwardly with respect to the lower end, whereby the coins will tend to lie with their faces adjacent the respective wall 34. Preferably also the internal thickness of each store is only slightly greater than the thickness of the coins to be stored therein. This renders more accurate the determination of the number of coins within the store. This determination can be used in

the control of the routing of the coins to the stores and the dispensing of the coins from the stores, as well as in the provision of audit information.

As an alternative, a connection may be made to the coins within the stores, eg. via the escapement arm 60, so that the capacitances between the coins and the layers on the respective sides of the store can both be measured.

The device (eg. a microprocessor) which determines from the measured capacitance the number of coins in the store may also take into account other information, such as the identifying information obtained from the identifying device of each of the panels, or other stored information relating to, eg., coin diameter.

Referring again to Figure 1, it will be appreciated that coins passing edge first through the separator module 12 do not have to be rotated substantially out of the vertical plane in which they are moving in order to enter the storage module 14. This differs substantially from many other arrangements, particularly those involving storage tubes, and reduces the possibility of jams. Indeed, because coins travel in substantially the same plane through the validator module 8 (except for a slight inclination as shown in Figure 1 to ensure the coins

travel against one face of a ramp in the validator), this means that there is no requirement for any substantial rotation of the coin about an axis within the plane of the coin throughout the entire passage of the coin through the coin handling apparatus.

References herein to coins should be taken to include tokens or other items of similar shape and size.

CLAIMS:

1. Coin storage and dispensing apparatus comprising a store arranged to store coins edge-to-edge in a two-dimensional array, and means for dispensing a controlled number of the coins from the store.

2. Apparatus as claimed in claim 1, including a dispensing structure arranged to operate in a cycle having at least two stages, one of the stages permitting said controlled number of coins to enter an exit region of the store, and the other cycle permitting said controlled number of coins to leave the exit region while preventing further coins from entering the exit region.

3. Apparatus as claimed in claim 2, including a motor arranged to rotate in order to cause the dispensing structure to execute a cycle of operation.

4. Apparatus as claimed in any preceding claim, including an agitator member arranged to move within the store in order to alter the configuration of the area within which the coins are disposed.

5. Apparatus as claimed in claim 4 when dependent upon claim 3, wherein the motor is also arranged to cause the agitator member to move.

6. Apparatus as claimed in claim 5, wherein the dispensing structure and the agitator member are moved in succession.

7. Apparatus as claimed in any preceding claim, wherein the store is formed by a pair of walls which are either conductive or have conductive layers adjacent thereto, the apparatus further including means responsive to the capacitance between the walls for providing a signal indicative of a number of coins in the store.

8. Apparatus as claimed in claim 7, wherein the coins are insulated from the conductive walls or the conductive layers.

9. Apparatus as claimed in any preceding claim, including means for supporting the store in an inclined fashion such that the coins tend to lay with their faces against an inner surface of the store.

10. Apparatus as claimed in any preceding claim,

wherein the controlled number is one.

11. An assembly comprising a plurality of coin storage and dispensing apparatuses each as claimed in any preceding claim, each of the stores being formed by a panel structure, and the panel structures being disposed face-to-face.

12. An assembly as claimed in claim 11, wherein each store has an entry, and wherein the entries of the stores are disposed adjacent each other.

13. An assembly as claimed in claim 12, wherein the entries are aligned.

14. An assembly as claimed in any one of claims 11 to 13, wherein the panel structures have substantially equal external thicknesses.

15. An assembly as claimed in claim 14, wherein at least one of the panel structures has an internal thickness which differs from that of at least one other panel structure, so as to suit coins of different thickness.

16. An assembly as claimed in any one of claims

11 to 15, wherein each storage and dispensing apparatus is in accordance with claim 2 or any claim dependent thereon, and wherein at least one of the stores includes a separately-formed adjustment member which has been attached to the panel structure in order to reduce the size of the exit region and thereby render the store suitable for dispensing coins of a predetermined diameter.

17. An assembly as claimed in any one of claims 11 to 16, wherein each of the storage and dispensing apparatuses is in accordance with claim 3 or any claim dependent thereon, and wherein there is a single motor for operating all the dispensing structures.

18. Apparatus as claimed in claim 17, wherein each storage and dispensing apparatus has an individual disabling means for rendering the dispensing structure inoperative while the motor operates.

19. An assembly as claimed in claim 17 or claim 18, the arrangement being such that a plurality of disabling means can be inoperative at the same time, thereby to enable dispensing of a plurality of coins simultaneously from respective stores.

20. An assembly as claimed in any one of claims 11 to 19, wherein the exterior surfaces of the panel structures are castellated, the panel structures being mounted in an interengaging manner.

21. An assembly as claimed in any one of claims 11 to 20, wherein each panel structure has a machine-readable indicator to indicate either the denomination of coins stored therein or the range of coin sizes capable of being stored therein, the assembly further comprising means for reading the indicators of each panel structure.

22. Coin handling apparatus comprising an assembly as claimed in any one of claims 11 to 21, and a separator arranged to receive coins along a separator entry path and to direct the coins selectively to any one of the stores.

23. Apparatus as claimed in claim 22, wherein the separator is an active separator capable of directing a coin to any one of the stores irrespective of the coin's dimensions in accordance with an electrical signal received thereby.

24. Coin handling apparatus as claimed in claim 22 or 23, including a coin validator arranged to receive and validate coins and to deliver them to the separator.

25. Coin handling apparatus as claimed in claim 24, including a substantially flat spine member, the validator, separator and storage assembly being mounted on a face of the spine member and being supported by the spine member without requiring further support at either side thereof.

26. Coin handling apparatus as claimed in any one of claims 22 to 25, wherein the separator and storage assembly are so arranged that coins travel through the separator and enter the stores edge-first and are dispensed from the stores edge-first, whereby no coin is rotated substantially out of a plane parallel to the two-dimensional arrays in which the coins are stored during passage of the coin through the apparatus.

27. Coin handling apparatus comprising a validator for receiving and validating coins, a separator for receiving coins from the validator, and storage apparatus having a plurality of stores, the

separator being capable of delivering coins to any one of said stores, the apparatus further comprising a substantially flat spine member, the validator, separator and storage assembly being mounted on a face of the spine member and being supported by the spine member without requiring further support at either side thereof.

28. Coin storage apparatus comprising means for storing coins, and means for measuring the capacitance of the region in which the coins are stored to provide an indication of the number of coins therein.

29. Apparatus as claimed in claim 28, wherein the storing means comprising a pair of walls, the walls being spaced apart to permit the coins to be stored in a two-dimensional array between the walls.

30. Apparatus as claimed in claim 29, including means for supporting the storing means in an inclined orientation such that the coins tend to rest with their faces against one of the walls.

31. Apparatus as claimed in claim 29 or claim 30, wherein the walls have conductive outer layers.

32. Apparatus as claimed in claim 29 or claim 30, wherein the walls are conductive.

33. Coin handling apparatus substantially as herein described with reference to the accompanying drawings.

34. A method of manufacturing an assembly of coin storage and dispensing apparatuses for storing a plurality of coins of different denominations, the method comprising providing a plurality of coin storage and dispensing apparatuses each as claimed in any one of claims 1 to 10, the stores having different internal dimensions in order to render them suitable for use with coins of different thicknesses and diameters, the method further comprising selecting a plurality of said apparatuses according to the thicknesses and diameters of the coin denominations to be stored and assembling the selected apparatuses together.

35. A method of providing an assembly of coin storage and dispensing apparatuses for storing a plurality of coins of different denominations, the method comprising providing a plurality of coin storage and dispensing apparatuses each as claimed in

any one of claims 1 to 10, the apparatuses having different internal dimensions in order to render them suitable for use with coins of different thicknesses, the method further comprising selecting a plurality of said apparatuses according to the thicknesses of the coin denominations to be stored and assembling the selected apparatuses together.

36. A method as claimed in claim 35, further including the step of rendering at least one of the stores suitable for use with coins of the diameter of the denomination to be stored thereby by fitting thereto an adjustment member arranged to adjust the width of a coin dispensing region of the store.

37. A method as claimed in any one of claims 34 to 36, wherein each store is formed of a flat panel structure, and the structures are assembled together face-to-face.

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